**Assignment: Rube Goldberg Machine**

Time: 10-15 class periods

**Resources**

[Invention Cartoon: Self-Scrubbing Bath Brush](http://learn.stem101.org/mod/page/view.php?id=17176)  
[Invention Cartoon: Can Opener](http://learn.stem101.org/mod/page/view.php?id=17075)

**Case Study**

Students of all ages are participating in national engineering contests, transforming everyday material into their own wacky and innovative machines. The Machine Contest allows wild and ingenious inventions to be shown and provides a learning engineering experience. Students will design, build, and test a Rube Goldberg Machine. Best known for his INVENTION cartoons that use a string of outlandish tools, people, plants, and steps to accomplish everyday simple tasks in the most complicated way, Pulitzer Prize winning cartoonist Rube Goldberg's drawings point out that people are often overwhelmed by complicating their lives.



In this activity, students will design, build, and test a machine that will select, clean, and peel an apple in a minimum of ten steps. This gives students the chance to use everyday materials and transform them into a wacky, innovative machine that accomplishes the task. Your assignment will also include a step-by-step description of the machine’s systems and operation, development of working drawings, and a prototype.

**Assessment**

The Rube Goldberg activity is complex and, therefore, must have established design requirements. Otherwise, grading would be next to impossible. Listed below are the rules for the project:

* The machine must complete its task in no fewer than ten steps. (A step is defined as a linear process, not a parallel process. If a plane, for example, moves up a wire and triggers a switch, that would be an example of one complete step. If the plane causes two things to happen, that would be a parallel result and would only count as one complete step. The description must be legible and concise.)
* Deduction of points for any human intervention on your machine while in motion.
* The machine must operate within a two-foot cube
  + Height: two feet
  + Width: two feet
  + Depth: two feet
* A machine must not imply profane, indecent, or lewd expressions.
* A machine may not incorporate any live animal.
* Any loose or flying objects must remain within the set boundaries of the machine.
* No combustible fluids, explosives, open flames, or hazardous materials.
* A marble is used to start the process.
* Must have three simple machines.
* No more than two mousetraps.

**Additional Resources**

<http://rubegoldberg.com/> The official Rube Goldberg website.

<http://www.uwm.edu/CEAS/rube/> The University of Wisconsin- Milwaukee’s home page. UWM hosts a state competition every year for high school students. Many states and local areas run competitions check with your local engineering college for more information.

<http://www.sciam.com/> Scientific American’s web site. The graphic and description was featured on this website (with permission of Rube Goldberg, Inc.) in April 1998

A new book on Rube Goldberg and his work, plus instruction book on the Rube Goldberg Machine Contest, is now in progress. The only publication in print is published by Stewart, Tabori, and Chang (under license from Rube Goldberg, Inc). It's a postcard book with 30 color postcards illustrating Rube's INVENTIONS. The ISBN is 1-55670-524-7. You can order it through your local bookstore.

Marzio, P.C. Rube Goldberg, His Life and Work. New York: Harper & Row, 1973.

Kinnaird, C. Rube Goldberg vs. The Machine Age. Fern Park, FL: Hastings House, 1968.

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